## REMARKS

By this response, claims 18-29 have been cancelled. Claims 1, 2, 7, 9, 10, 13 and 15 have been amended. Accordingly, claims 1 through 17 are active in this application and reconsideration of all active claims is respectfully requested.

## DRAWINGS

The Examiner objected to the drawings under 37CFR 1.83(a). The Examiner indicated that the drawings must show every feature of the invention specified in the claims. Therefore, the phrase "said electrodes being electically coupled together and "*to a source of programming energy*" in claim 13, in lines 5-6 must be shown or the feature(s) canceled from the claims(s). No new matter should be entered.

The Examiner's attention is directed to paragraph [34] in the specification and Fig. 6 which shows and describes "fuse element 200 receives a programming voltage Vp." Accordingly, it is respectfully submitted that the phrase mentioned in claim 13 is shown and described and the objection should be removed..

## SPECIFICATION

The Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP 608.01(o). Correction of the following is required: Antecedent basis for the claimed subject matter in claim 13 in lines 5-6 is required, namely:

the phrase "said electrodes being electrically coupled together and to a source of programming energy" which is not disclosed in the description section of the specification. The disclosure only discloses the source of programming energy is coupled to a diffusion electrode.

The Examiner's attention is directed to a paragraph [34] in the specification and Fig. 6 which shows and describes "fuse element 200 receives a programming voltage Vp." Accordingly, it is respectfully submitted that the phrase mentioned in claim 13 is shown and described and the objection should be removed.

## CLAIM OBJECTIONS

The Examiner bjected to Claim 9 because of the following informalites:

The phrase said source of programming energy comprises a voltage source is misdescriptive because there is insufficient antecedent basis for this limitation in the claim. The examiner suggests that the programmable element further comprising a source of programmable energy, wherein said source of programmable energy comprises a voltage source.

By this response, claim 9 has been amended as the Examiner suggests and the Applicants request the objection be removed.

**Claim Rejection 35 U.S.C. § 102**

The Examiner rejected claims 1-6 under 35 U.S.C. § 102(b) as being anticipated by Chen, et al. (US5,656,534).

The Examiner indicated regarding claim 1, Chen et al. teach a programmable element, comprising (Fig 3): a first device (10) on a substrate (18) having a first electrode (36') and a first insulator (28) disposed between the substrate and said first electrode, said first insulator having a first value of a given parameter; a second device (12) on a substrate (18) having a second electrode (36") and a second insulator (26) disposed between the substrate and said second electrode, said second insulator having a second value of said given parameter that is different from said first value (Col.3, lines 60-65).

The Examiner indicated that Chen et al teach said given parameter is thickness; teach said first insulator (28) has a dielectric breakdown voltage that is less than that of said second insulator (26); Chen et al. teach said first insulator is comprised of oxide layer. Chen et al. do not expresaly teach the oxide layer being an silicon oxide. However, it is recognized in the art that the oxide is a generic term used for silica, particularly silicon oxide. Therefore the phrase "oxide layer" would meet the recited term "silicon oxide". Chen et al. teach said first device further comprising a third electrode (14) on the substrate adjacent said insulator of said first device; Chen et al teach said third electrode comprising a diffusion region; and Chen et al teach a programmable element, comprising a programmable device comprised of a first integrated circuit element (10) having a first dielectric breakdown voltage and a gain device comprised of a second integrated circuit element (12) having a second dielectric breakdown voltage circuit elements each having at least

one electrode, said electrodes being electrically coupled together and to a source of programmable energy, said second integrated circuit element conducting current when the first integrated circuit element has been programmed (Col. 3, lines 59-65).

It should be noted that Chen is not addressing the same problem that is being addressed by the subject application in that Chen teaches ESD protection (device 10) of an antifuse (device 12) wherein the dielectric thickness of the protection circuit in 10 is less than the dielectric thickness of the antifuse, device 12. The devices (10 and 12) are separated by an isolation feature, 20. This ordering of elements is diametrically opposite to that in subject invention. Referring to the figures 1B and 6 of the present invention, device 16A is the Anti-Fuse, and device 16B provides gain such that a high impedance anti-fuse can be read using a conventional latch. These devices SHARE a common diffusion node, and does not require separation by an isolation feature. This is one of the novel aspects of the present invention. The antifuse 16A has a dielectric that is thinner than the gain device thickness in 16B. Thus, this invention is quite different than Chen, based on the physical structure of the antifuse versus external devices. In addition, Chen does NOT teach the use of a gain device to assist in the reading of a high impedance (Post programmed) anti-fuse. Chen specifically references patents 4,823,181 and 4,899,205, which discuss LOW impedance antifuse elements. It is understood that a LOW impedance anti-fuse is sometimes considered a desirable result, but there exists a stistical HIGH impedance tail on greater than 1% of the population of programmed anti-fuses rendering these antifuses unreliable. In fact, they cannot guarantee a properly sensed, or latched result. Hence the present invention is directed to structure that can reliably handle the high impedance of a post programmed Anti-Fuse. Chen does NOT address or contemplate this problem. In fact, since Chen's anti-fuse dielectric is

THICKER than the surrounding parallel device dielectrics, one would questi n Chen's ability to program such dielectrics as they are in parallel with the protection circuitry. This creates a layer of complexity that we do not have to solve. For example Chen's ESD device 10 has to be disabled during anti-fuse (device 12) programming, as device 10 by Chen's description would program, or in this case undergo damage prior to the anti-fuse. Thus, Chen would have to hold node 14 at the programming potential of node 36. This technique (although it requires another wiring interconnect) will work assuming node 10 did not undergo an ESD damaging event. If node 10 was damaged through an ESD event, then there would be a low impedance path between nodes 16 –>36–>14 or vice versa pending the programming polarity, thus making it impossible to program device 12. Chen basically has two MOS capacitors, with device 10 (ESD protection device) having a gate that is shared with device 12 (Anti-fuse) and a separate diffusion 14, and another diffusion (16) for the anti-fuse, hence three terminals. But, in our invention, the three electrodes create a MOSFET device, clearly not the same as Chen's structure. Further, with regard to claim 13 it should be noted that Chen does not teach a gain device as his device 10 is a capacitor versus wherein our invention the gain device is a MOSFET. Also, the thickness of Chen's Anti-fuse oxide as contrasted with surrounding devices is quite different than our invention.

Accordingly, it is respectfully submitted that Chen teaches away from the present invention and could not anticipate the present invention. Some amendments have been made to claims 1-6 and 13 to more clearly claim our invention. Accordingly, it is respectfully submitted that these claims are allowable under 35 U.S.C. § 102(b) and should be passed to issue.

**Claim Rejection 35 U.S.C. § 103**

The Examiner rejected claim 9 under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. in view of Bracchitta et al. (US6,130,469).

Chen et al. do not explicitly teach the programmable element further including a source of programmable energy, wherein said source of programming energy comprises a voltage source. However, it is conventional to use the voltage source as a source of programmable energy and also Bracchitta et al. in Fig 1 teach the programmable element comprising a voltage source (18) served as a source of programmable energy. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the voltage source as the source of programmable energy in Chen's device in order to alternate the characteristic of an integrated circuit.

Since claim 9 is dependent on claim 6 which has been discussed above and is considered to be allowable, it is respectfully submitted that claim 9 should be allowable under 35 U.S.C. § 103(a).

## ALLOWABLE SUBJECT MATTER

The Examiner objected to Claims ~~7~~, 8, 10-12 and 14-17 as being dependent upon a rejected ~~base~~ claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

By this response claims 7, 8, 10-12, and 14-17 have been amended to be in independent form including all of the limitations of the base claim and any intervening claims. Accordingly, it is respectfully submitted that these claims are now allowable.

**Conclusion**

Based on the foregoing, it is respectfully submitted that all the claims active in the subject patent application are in condition for allowance and that the application may be passed to issuance.

The Examiner is urged to call the undersigned at the number listed below if, in the Examiner's opinion, such a phone conference would aid in furthering the prosecution of this application.

Respectfully submitted,
For: Fifield, et al.

8/8/2003

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